LENOX CHINA

A DIVISION OF LENOX, INC.

POMONA, NEW JERSEY

10B

DRAFT RCRA FACILITY INVESTIGATION WORKPLAN

8/1/93

PROJECT #530-7

APRIL 1993

REVISED AUGUST 1993

EDER ASSOCIATES

CONSULTING ENGINEERS, P.C.

Locust Valley, New York

Madison, Wisconsin

Ann Arbor, Michigan

Augusta, Georgia

Jacksonville, Florida

Trenton, New Jersey

LENOX

August 25, 1993

CERTIFIED MAIL

Mr. Frank Faranca, Project Manager
State of New Jersey Department of
Environmental Protection and Energy
Division of Responsible Party Site Remediation
Bureau of Federal Case Management
401 East State Street
CN 028
Trenton, New Jersey 08625-0028

Re: Lenox China, Pomona
Galloway Township, Atlantic County
RCRA Facility Investigation (RFI) Work Plan

Dear Mr. Faranca:

Lenox China is pleased to submit three copies of the August 1993 revision of the April 1993 RCRA Facility Investigation (RFI) Work Plan, which has been prepared by Eder Associates Consulting Engineers, P.C. (Eder). This work plan addresses the requirements contained in Part VI, Section I, Item B of Lenox's NJPDES-DGW permit (No. NJ0070343) and Module III of Lenox's USEPA HSWA permit (EPA I.D. No. 002325074) and incorporates the consolidated NJDEPE and USEPA comments of June 7, 1993, in accordance with several conference calls, letters and the meeting on July 12, 1993. Copies of the July 12 and July 14, 1993, confirmation letters are attached.

Sincerely,

John F. Kinkela
Director of Environmental Engineering

sm

Attachment

c Stephen F. Lichtenstein
Gary Berman
Nicholas Andrianas (Eder Associates)

Mr. Andrew Park (1 additional copy)
United States Environmental Protection Agency
Air and Waste Management Division
Hazardous Waste Facilities Branch
Region II
26 Federal Plaza
New York, New York 10278

✓ United States Environmental Protection Agency
Office of Policy and Management
Permits Administration Branch
Region II
26 Federal Plaza
New York, New York 10278

eder associates
consulting engineers, p. c.

OFFICES:
Locust Valley, NY
Madison, WI
Ann Arbor, MI
Augusta, GA
Jacksonville, FL
Trenton, NJ

July 12, 1993
File # 530-7

Mr. Frank F. Faranca, Project Manager
New Jersey Department of Environmental
Protection & Energy
Division of Responsible Party
Bureau of Federal Case Management
CN028
401 East State Street
Trenton, New Jersey 08625-0028

Re: RCRA Facility Investigation Work Plan
Lenox China Facility
Pomona, New Jersey

Dear Mr. Faranca:

Thank you for the opportunity to discuss and resolve various RFI Work Plan comments during our July 8, 1993 telephone conference call. I have summarized the agreements reached during the conference call below. The comment numbers correspond to the same numbers in the NJDEPE and USEPA collective June 7, 1993 comment letter.

Comment #3: Section 2.0 (p.8) - The detection limit for total lead in the Tilton Road Pond should be 10 ug/l or less. Lenox shall insure that all future samples from the pond meet this criteria.

Response: NJDEPE accepts the 50 ug/l lead detection limit for Tilton Road sampling at this time, but reserves its right to change this limit through a permit modification at a later date.

Comment #4: Section 2.0 (p.8) - Pursuant to Appendix B, Section III, B.1.c.2, Lenox must submit information on the biological oxygen demand (BOD) on the Tilton Road Pond. Lenox shall insure that all future sampling events for the pond meet this parameter.

Response: Lenox agrees to run one round of sampling for characterization purposes only and to analyze samples for BOD.

Continued . . .

Comment #5: Section 2.0 (p.8) - Pursuant to Appendix B, Section III, B.1.c.2, Lenox must submit a description of the sediment characteristics such as (a) deposition area; (b) thickness profile, and, (c) physical and chemical parameters. Please revise this section to insure proper sediment characteristics are adequately defined in the Scope of Work.

Response: Lenox agrees to collect the information required by comment 5a and 5b and to run the parameters requested by NJDEPE in comment 5c on one round of samples collected from Tilton Road Pond for characterization purposes. In addition, NJDEPE clarified that the "specific contaminant concentrations" at Appendix B, Section III, B.1.c.2, refers to lead and zinc.

Comment #7: Section 2.0 (p.9) - Appendix E must be clearly marked as to which set of analyses refer to slip waste, glaze waste and treated industrial wastewater. The use of TCLP results to characterize each unit is unacceptable, as this test is used for disposal purposes (classification of the waste) only. Please submit a full analysis to adequately characterize the waste, as several contaminants of concern may be a characteristic of this waste.

Response: Lenox will clearly mark Appendix E. In addition to lead and zinc, NJDEPE is requesting that Lenox analyze the target analyte list metals to confirm that lead and zinc are the only contaminants of concern. Lenox will analyze the slip waste, glaze waste, and treated industrial wastewater samples for these metals as the "full analysis" to characterize the waste, or Lenox will include the TAL metals on two rounds of groundwater monitoring well sampling to confirm the absence or presence of TAL metals in groundwater.

Continued . . .

Mr. Frank F. Faranca
New Jersey Department of Environmental
Protection and Energy
July 12, 1993

Comment #9: Section 3.0 (general) - The scope of work for a number of the SWMUs contain statements which say that groundwater sampling for lead at specific wells will not be necessary if unfiltered samples are below standards after two rounds. The Department and EPA will make all decisions regarding the removal of parameters from the sampling and analysis program. These statements should be deleted from the work plan.

Response: Lenox will delete the following language from pages 12, 13, 14, 15, 16, 20, 21, and 22 in the RFI Work Plan: "If the analysis shows that the current NJDEPE groundwater quality standard of 10 ppb lead is met, there will be no additional sampling for lead in groundwater samples from this monitoring well."

Comment #24 Section 3.0 (SWMU 12, p.19) - Although six (6) soil borings were drilled at this location in 1989, none of these samples were collected from beneath the former pad. Lenox shall perform a minimum of three borings equally spaced in this area. These borings shall have the same sample depths and be sampled for the same parameters listed in Appendix D (Soil Sampling Analytical Data for SWMU 12).

Response: If Lenox can locate soil sampling results for borings taken through the center of the concrete pad, NJDEPE may not require the additional borings requested in this comment. The need for any further soil investigation at the drum storage pad will be further discussed with NJDEPE at the July 12, 1993 meeting.

Continued . . .

Mr. Frank F. Faranca
New Jersey Department of Environmental
Protection and Energy
July 12, 1993

To facilitate your review and approval of our understanding of the agreements reached during the conference call, please return a signed copy of this letter to me.

We look forward to meeting with you on July 12 to resolve the remaining RFI Work Plan comments.

Very truly yours,

EDER ASSOCIATES CONSULTING ENGINEERS, P.C.

Nicholas A. Andrianas, P.E.
Senior Environmental Engineer
NAA/mw

cc: S. Lichtenstein
J. Kinkela
A. Gustray
G. Berman

APPROVED BY:

Frank F. Faranca

7/12/93
DATE

MW2617

LENOX

STEPHEN F. LICHTENSTEIN
SENIOR VICE PRESIDENT
SECRETARY AND
GENERAL COUNSEL

July 14, 1993

BY FACSIMILE AND REGULAR MAIL

Mr. Frank Faranca, Project Manager
New Jersey Department of Environmental
Protection and Energy
Division of Responsible Party Site Remediation
Bureau of Federal Case Management
CN 028
401 East State Street
Trenton, New Jersey 08625-0028

Mr. Andrew Park
United States Environmental Protection Agency
Air and Waste Management Division
Hazardous Waste Facilities Branch
Region II
26 Federal Plaza
New York, New York 10278

Re: Lenox China Facility
RFI Work Plan

Gentlemen:

This letter will summarize the agreements reached regarding certain RFI work plan comments during our meeting at the NJDEPE offices on July 12, 1993 and a telephone conference call on July 13, 1993. These agreements are in addition to those set forth in the July 12, 1993 Eder Associates letter to you. The comment numbers listed correspond to the same numbers in the NJDEPE and USEPA collective June 7, 1993 comment letter:

Comment #11:

Section 3.0 (general - ground water sampling) - Although two (2) additional rounds of ground water sampling for lead and zinc are required to determine if an impact to ground water has occurred, this does not necessarily mean that additional sampling for these constituents will not be required in the future. Since the facility has managed

wastes that contain lead, zinc and trichloroethylene as major constituents, these constituents should be continued to be monitored, in addition to monitoring of ground water for Target Compound List plus 30 (TCL+30) on a less frequent basis.

Comment #19:

Section 3.0 (SWMU 5,p.15) - See comments 2,3,4, and 5 stated above. In addition, the work plan must contain a map or diagram which specifies the sediment sampling points for this SWMU.

Lenox has indicated in the test that the SWMU is clean and that no further action would be needed. The proposed sampling is to provide supporting evidence. However, the RFI work plan does not clearly state the purpose of the sampling for this or any other SWMU. The plan should be revised to include statements with regard to the purposes of the sampling. If the sampling is indeed to prove that the areas of the SWMUs are clean, Lenox must collect (in addition to the sediment samples), the soil samples beneath and/or in the sides of the unit. In addition, the soil and sediment samples must be analyzed for TCL+30 and the Target Analyte List (TAL).

Comment #20:

Section 3.0 (general SWMU's 6,7 and 8) - Soil sampling is proposed for SWMUs 6,7, & 8. Lenox indicated that the SWMUs are clean and that no further action would be needed. Again, the RFI work plan must clearly state the purposes of the sampling. If the sampling is indeed to prove that the areas of the SWMUs are clean and, therefore, no further action would be needed, the Department and EPA require that TCL+30 and TAL be analyzed for the proposed soil samples. Considering the sizes of SWMUs 6,7,and 8, the Department and EPA agree with the proposed numbers of samples for these SWMUs.

Response to Comments #11, #19 and #20:

In lieu of the monitoring of ground water and/or soil for the Target Compound List plus 30 (TCL+30) and the Target Analyte List (TAL), Lenox will provide in the revised RFI Work Plan a Chemical Constituents Inventory

of all raw materials which were and continue to be used at the Lenox China facility in Pomona, New Jersey. This inventory will present all raw materials usage at the facility by major and minor classifications. Certain de-minimus usages, such as decals, will not be included. A certification of accuracy as to this Inventory will be provided pursuant to New Jersey Regulation 7:26E-1.5. If the Inventory includes constituents other than Lead, Zinc and TCE, Lenox will propose, if in its best professional judgment it believes monitoring is required, ground water and soil sampling plans for each SWMU based upon the Inventory.

Specifically with regard to #19, the Work Plan will contain a map or diagram specifying the sediment sampling points for SWMU 5 and statements with regard to the purposes of the sampling. If the purpose is to prove that the areas of this or any other SWMU is clean, Lenox will collect soil samples beneath and/or in the sides of the unit (in addition to the sediment samples).

Specifically with regard to Comment #20, Lenox will state in the RFI Work Plan with regard to SWMU 6, 7 and 8 the purposes of the sampling.

Comment #13:

Section 3.0 (general - SWMUs 1,2,3, and 9) - Lenox has indicated in the text that previously conducted investigations would satisfy the requirements of the RFI. It is recommended that Lenox submit the raw data to the Department for validation.

Response to Comment #13:

Data validation will not be required. Lenox will submit the results and laboratory reports (including whatever QA/QC documents accompany the report) of Appendix IX groundwater sampling of wells conducted in 1986. Lenox also will specify in the RFI Work Plan the precise locations in the Appendices of the RFI Work Plan of the raw data provided for those SWMUs.

Comment #14:

Section 3.0 (SWMU 1,p.11) - Based on the results of the previous investigation, an additional soil investigation is not necessary. The proposed monitoring well location as plotted on the location map is acceptable for the purposes of monitoring the TCE plume at the Lenox property boundary. However, the width of the plume on-site has to be monitored. Since no wells are located on the northeast side of the property to monitor the plume width, an additional well, approximately 600 feet northeast of the degreaser sludge pit in the area between the baseball field and dense vegetation is needed.

Response to Comment #14:

It was clarified at the meeting on July 12, 1993 that this comment is not asking for a monitoring well in addition to that proposed in the Facility Investigation Work Plan but, rather, that the well proposed in the Plan should be relocated to a point agreed upon by the NJDEPE. Lenox will relocate the proposed well to an agreed upon point.

Comment #15:

Section 3.0 (SWMU 2, p.12) - As mentioned previously, the TCLP test is used for the classification of waste prior to disposal and is not to be used to characterize the site. In the text, Appendix D is referenced as having total lead results for seven (7) soil samples (the results of a soil investigation). This information was not presented in the text as stated. If this information is available please submit it, otherwise, additional soil sampling the **characterize** the site will be necessary. Lenox must amend the work plan to include a description of the soil investigation along with the analytical results.

The ground water monitoring parameters will include both lead and zinc.

Response to Comment #15:

This comment has been resolved by the agreed upon response to Item 7 set forth in the July 12, 1993 Eder Associates letter to Mr. Faranca. Vertical and horizontal soil sampling data already is sufficiently provided in the Work Plan.

Lenox already has agreed to the ground water monitoring parameters of lead and zinc.

Comment #26:

Section 3.0 (SWMU 13, p.20) - The ground water analytical results collected from the August 13, 1991 sampling event do indicate that the Department's action level of 10 ppb of total lead has been exceeded which indicates that this unit is a possible source of contamination to ground water. In addition, the soil sampling that took place utilized composite sampling for the EP toxicity method (now revised to TCLP, for disposal purposes only), which is unacceptable for characterization of this SWMU. Moreover, the text indicates that the total lead concentrations in the slip and/or glaze waste is less than 600 ppm. This is not documented anywhere in Appendix D. In addition, the work plan does not identify the location or depths of any soil samples taken at this area of concern and does not present any analytical data regarding soil sampling results.

A figure in Appendix D shows the thickness of the waste sludge as delineated during the past investigation. However, the unit (i.e. inches, feet) which define the thickness is not indicated on the figure.

Based upon the above, Lenox must adequately delineate the vertical and horizontal extent of lead and zinc in this unit by additional soil sampling on a grid basis with discrete locations. Based upon the results of this sampling event, Lenox may be directed, pursuant to Part V of this NJPDES permit and Module III, condition B.6.a of the HSWA permit, to design and implement an Interim Remedial/Corrective Measure at this unit, to protect human health and the environment.

Response to Comment #26:

Lenox will propose in the Revised Work Plan a supplemental soil sampling program to confirm the horizontal extent of lead and zinc contamination for SWMU #13. This program will include samples at the edges of this SWMU taken vertically at intervals of 0 to 6 inches, 6 to 24 inches and in two-foot increments to groundwater. Samples will also be taken at several selected

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areas within the footprint of this SWMU where waste contamination is present. These soil samples will be analyzed for Lead, Zinc and TCE on a one time basis for characterization purposes. A groundwater sampling program of an existing downgradient well will also be proposed after consultation with Mr. Daryl Clark of the NJDEPE.

It was agreed that the revised RFI Work Plan will be submitted on or before August 30, 1993 and you will confirm this schedule directly to Lenox in writing.

To confirm the agreements reached during the meeting and conference call as set forth in this letter, would each of you please return your signed copy of this letter to Mr. John Kinkela.

Sincerely yours,

LENOX, INCORPORATED

Stephen F. Lichtenstein

cc: J.F. Kinkela
N.A. Andrianas, Eder Associates
G.W. Berman, P.E.

APPROVED BY:

Frank Faranca 7/22/93
Frank Faranca Date

Andrew Park Date

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, NEW YORK 10278

7/27 shud be 14 - Park will fax correction FYI

July 22, 1993

I concur with the letter dated July 14, 1993, from Mr. Stephen F. Lichtenstein to Messrs. Frank Faranca and Andrew Park, with the following condition:

A revised RFI workplan that will be submitted in response to the June 7, 1993 comment letter, and any information in the workplan which is relevant to complete site assessment including a Chemical constituent Inventory and soil and groundwater sampling plans, must be reviewed and approved by EPA and NJDEPE.

Andrew Y. Park, Environmental Engineer
Hazardous Waste Facilities Branch
U.S. Environmental Protection Agency Region II

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, NEW YORK 10278

July 23, 1993

In my letter dated July 22, 1993, I stated that I concur with the letter dated July 24, 1993. The date of July 24, 1993 was wrongly stated. The correct date is July 14, 1993.

Andrew Y. Park, Environmental Engineer
Hazardous Waste Facilities Branch
U.S. Environmental Protection Agency Region II

CERTIFICATION STATEMENT

I certify under penalty of law that the information provided in the RCRA Facility Investigation (RFI) Work Plan is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize a violation of any statute, I am personnaly liable for the penalties.

Nicholas A. Andrianas, P.E.
Vice President
Senior Environmental Engineer
EDER ASSOCIATES CONSULTING ENGINEERS, P.C.

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1.0 PURPOSE OF THE REPORT

This Draft RCRA Facility Investigation (RFI) Work Plan satisfies the joint permit requirements of the New Jersey Department of Environmental Protection and Energy (NJDEPE) and the United States Environmental Protection Agency (USEPA) for the Lenox China, a division of Lenox, Inc. (Lenox) property in Pomona, Atlantic County, New Jersey. The permit requirements for NJPDES - DGW Permit No. NJ0070343 are enumerated in the Permit in Appendix B Section III, and the permit requirements for USEPA HSWA Permit EPA I.D. No. NJD002325074 are identified in Appendix A of the Permit as Tasks III and IV. This report describes the RFI scope of work and provides a Field Sampling Plan to characterize the environmental setting and solid waste management units (SWMUs) at the Lenox facility.

In general, the NJPDES-DGW permit requires that Lenox do the following:

- Characterize waste and other materials which are, or may be, the source(s) of releases at the site;
- Determine the nature, type, and physical states of soil, surface water, and/or groundwater releases at and/or emanating from solid waste management units and/or other potential source areas at the site;
- Determine the horizontal and vertical extent of soil, surface water, and groundwater releases at and/or emanating from solid waste management units and/or other potential source areas at the site;
- Determine migration paths through soil, groundwater, surface water, and sediment;
- Determine human health and environmental impacts of the releases and;

- Compile and evaluate the data needed to support the development of a corrective measures study and the selection of any remedy.

The NJPDES-DGW permit text is contained in Appendix A.

Reports which have been previously submitted to satisfy USEPA HSWA and NJDEPE permit requirements are as follows:

- Facility Background Report RCRA Facility Investigation Task I Report (February 1993, revised April 1993) submitted by Lenox China, April 1993. Contains a description of the Lenox facility site history and provides information on the history and current status of the SWMUs at the site. Appendices to this report contain summaries of a majority of the site sampling.

- RFI Health and Safety Plan submitted by Eder Associates Consulting Engineers, P.C. (Eder), March 1993. Provides a description of personal protection, hazard evaluation, contingency plan, air quality monitoring, and decontamination procedures for RFI activities.

- RFI Data Collection Quality Assurance Plan submitted by Eder, March 1993 (revised August 1993). Provides a description of data collection strategy, quality assurance objectives, sampling procedures, field measurements, and sample analysis for the RFI activities.

- RFI Project Management Plan submitted by Eder, March 1993 (revised August 1993). Contains a project schedule and description of key personnel responsibilities for RFI activities.

- RFI Data Management Plan submitted by Eder, March 1993 (revised August 1993). Summarizes data recording and presentation procedures for the RFI activities.

2.0 SITE HISTORY AND ENVIRONMENTAL SETTING

2.1 Site History

The Lenox facility is a modern, slab on grade, single-story structure on 56 acres of level land in Pomona, Galloway Township, New Jersey (Figure 1). Adjacent properties north, east and south of the plant are undeveloped. A golf course is under construction and a residential development is planned west of the plant, directly across Tilton Road. Figure 2 shows the site.

The Lenox facility began operations in 1954 and initially had 145,000 square feet of manufacturing area and 8,000 square feet of office space. Additions to the facility were made in 1964, 1968 and 1979 and, at the present time, the manufacturing facility has 346,000 total square feet and 23,000 square feet of office space. In addition, separate warehouses and other miscellaneous buildings total 45,000 square feet. Operations at the facility include the manufacture of fine china giftware, tableware and holloware. The facility employs approximately 1,100 people and is served by public sewer, gas and electric. Water is supplied to the plant by two on-site wells owned by Lenox. Treated industrial wastewater is discharged directly to a receiving stream (a ditch which discharges into the Jack Pudding Branch of the Babcock Swamp, Permit No. NJ0005177) and to the Atlantic County Utilities Authority (ACUA) sanitary system.

China manufacturing activities at Lenox include the preparation of a clay body utilizing various clay components that are shipped into the plant by rail and truck. The clay is mechanically processed in a water solution (slip) and dewatered by filter pressing or placing the slip in plaster molds. The formed pieces are fired in bisque kilns. The china is then coated with glaze and fired again in a glost kiln. Decorations are applied using decals, precious metal paints, or mechanical or acid etching prior to the final firing in decorating lehrs.

The primary hazardous materials used in the manufacturing process are lead, which is a major component in the glaze, and trichloroethylene (TCE), which is used in the acid etching process. The lead is purchased as a fritted lead compound (glass-encased lead).

The following Solid Waste Management Units (SWMUs) are at the Lenox site and are shown on Figure 2:

1. Degreaser Sludge Pit
2. Sludge Disposal Area
3. Waste Pile
4. Polishing Basin
5. Tilton Road Pond
6. Underground Effluent Transfer Pipe
7. Equalization Sump
8. Wastewater Treatment Piping
9. Underground Storage Tanks
10. Glaze Basin
11. Slip Basin
12. Drum Storage Area
13. Area Between Monitoring Well #10 and Aloe Street
14. Two Tanks (Neutralization)
15. Filter Press

2.2 Environmental Setting

2.2.1 Hydrogeology

Regional Geology (Zapecka; 1984)

The New Jersey coastal plain is a seaward-dipping wedge of unconsolidated clay, silt, sand and gravel coastal-marine deposits of Cretaceous to Holocene age. The Cretaceous and Tertiary sediments generally strike northeast - southwest and dip to the southeast 10 to 60 ft/mile. The overlying Quaternary deposits are generally flat lying. The coastal plain deposits thicken seaward to greater than 6,500 ft in Cape May County.

The coastal plain deposits are unconformably underlain by the Pre-Cambrian and lower Paleozoic bedrock basement. The altitude of the bedrock surface near Pomona is approximately 4400 to 4500 feet below mean sea level. Cretaceous age Potomac Group sediments overlie the bedrock. The Potomac group is overlain by the Raritan Formation which consists of fluvial-continental deposits and marine deposits. The Magothy Formation unconformably overlies the Raritan, and consists primarily of coarse beach sand and near shore marine deposits.

Younger Cretaceous and Tertiary sediments overlying the Magothy are transgressive/regressive sequences deposited during changes in sea-level. Generally, transgressive deposits are confining units and regressive units are the aquifers.

The Miocene Cohansey sand is the youngest marine deposit. Continental deposition returned during the Tertiary and Quaternary times with fluvial deposits including The Beacon Hill, Bridgeton, Pennsauken, and Cape May Formations.

The Kirkwood-Cohansey aquifer system is predominantly a water-table aquifer that underlies an area of approximately 3,000 mi^2. It is composed of the Kirkwood formation and Cohansey sand and can include the Beacon Hill Gravel, Bridgeton Formation and the Cape May Formation. The

thickness of the Kirkwood-Cohansey aquifer system ranges from 50 feet to 400 feet. The aquifer is confined by overlying Pleistocene deposits on the peninsula part of Cape May county.

Along coastal areas the Kirkwood Formation consists of thick clay beds with interbedded sand and gravel zones. Fine to medium sand and silty sand are common away from the coast and regionally extensive clay beds occur in the basal part of the formation.

The Cohansey sand is coarser grained consisting mainly of light colored quartz sand with minor amounts of pebbly sand, fine to coarse sand, silty and clayey sand with interbedded clay. Locally perched water-tables and semi-confined conditions can exist.

Fluvial deposits, the Beacon Hill gravel and the Bridgeton formation, overlie the Cohansey sand. In Cape May County the Cape May Formation directly overlies the Cohansey sand.

Site Hydrogeology

Geraghty & Miller (1990 and 1992) reported that the site is underlain by the Cohansey Sand/Kirkwood Formation, a white, tan and yellow-orange unconsolidated sand and gravel deposit interbedded with varying amounts of silt and clay. Hydrogeologic cross sections are shown on Figures 5 through 7. The deepest boring on-site 12D, reached 90 feet below grade. A discontinuous one to five foot thick clay layer was present at approximately 65 - 70 feet below grade.

The site is virtually flat with slopes less than 2%. The depth to water is approximately 3 to 10 feet below grade, and the water-table is relatively flat. The water-table elevation fluctuates seasonally between 3 and 9 feet. Groundwater flows from the west to east/northeast as shown on Figure 3.

Groundwater from upgradient monitoring well MW-1 is considered background. Analytical data from November of 1982 to February 1990 is contained in Appendix B.

Groundwater flow is affected by the on-site treatment system. There are seven recovery wells with total flow of 350 gallons per minute and two recharge areas.

There are also two production wells on the property referred to as Lenox 2 and Lenox 3. Both are screened below the 65 ft clay layer (Lenox 2 from 139 to 172 feet below grade and Lenox 3 from 121 to 161 feet). These wells presently have a total water allocation not to exceed 9 million gallons per month at a maximum rate of 300 gallons per minute (gpm). There are no other wells that pump more than 100,000 gallons per day (gpd) within a 1-mile radius of the site.

In 1988, Geraghty & Miller conducted a constant-rate pumping test on recovery well RW-1. Drawdown in piezometers 18, 19 and 20 was analyzed by the Boulton delayed-yield method. The calculated transmissivities ranged from 56,000 to 70,000 gallons per day per foot (gpd/ft), with an average of 63,000 gpd/ft. Calculated storativities ranged from 0.002 to 0.016 (average 0.010).

Based on soil borings drilled across the site, the subsurface sediments consist of white, tan and yellow-orange, course to very course quartzose sand and gravel with varying amounts of silt and clay. The sand and gravel deposits vary from poorly to well sorted and the individual particle shapes are generally spherical and sub-rounded to rounded.

As previously described, a discontinuous clay layer exists at the site between 65-70 feet; however, there has been no testing performed to determine the degree of hydraulic interconnection between the water table aquifer and the saturated zone below the clay layer.

Many of the subsurface soil samples collected at the site contained little to no clay to a depth of 60 feet. Although this may suggest that the subsurface sediments would have a small attenuation capacity, ion exchange capacity and organic carbon content tests have not been performed.

The extent of TCE in groundwater is well-defined as shown in Figure 4 and a remedial pump and treat system is currently in place and operating (Appendix C). This remediation system consists

of a carbon adsorption system that treats the pumpage from seven recovery wells. Additional groundwater sampling for TCE is conducted quarterly to monitor the groundwater remediation program.

2.2.2 Soils

On-site soils have been characterized by numerous borings. Typical boring logs for on-site groundwater monitoring wells and soil particle size distribution curves are shown in Appendix D.

Additional soil information was obtained from the USDA/SCS Soil Survey of Atlantic County, New Jersey. Soils identified at the site are FL - Filled Land, KmA - Klej Loamy Sand, Bp - Berryland Sand, and DoA - Downer Loamy Sand. The approximate distribution of these soils at the site is 50%, 20%, 10%, and 20% respectively. A portion of the area defined by SCS as filled land is now covered by the manufacturing plant (approximately 346,000 square feet) and paved areas.

Filled Land generally consists of areas which have been backfilled with several feet of quartz, sand, and gravel. This land type has a very low organic matter content and a low available water capacity. Permeability is generally rapid unless the backfill contains fines, therefore, filled land is usually considered to be excessively drained. Klej Loamy Sands are rapidly permeable and have low available water capacities. These soils are very acidic and have a pH value ranging from 3.6 to 4.4. Generally these soils are flat, with slopes of zero to three percent. These soils contain the same amount of clay in the subsoil as in the surface layer and have a low organic matter content. The water table in the Klej Series is seasonally high at 1.5 to 4 feet.

Downer Loamy Sand consists of nearly level or gently sloping, well drained soils with low organic matter content. These soils are strongly acidic (pH value ranging from 3.6 to 4.4) with moderate permeability and moderate available water capacity. Seasonal high water tables are deeper than 4 feet.

Berryland Sand is generally characterized by poorly drained, nearly level soils with intermittent high organic subsoils content. These soils are very acidic (pH value ranging from 3.6 to 4.4). Permeability is moderately rapid, and when drained, the soils have low water capacity. The seasonal high water table is generally at grade.

2.2.3 Surface Water and Sediment

There are five lined ponds within a half mile of the site. On the Lenox property, there is one pond (Tilton Road Pond) which discharges to the Jack Pudding Branch of Babcock Swamp. Tilton Road Pond influent water quality is monitored regularly in accordance with the requirements of the NJPDES-DGW permit and the analytical results are provided in Appendix B. Information on the characteristics of the other four ponds was not available and, due to their relative location is not relevant to the RFI.

2.2.4 Waste Characteristics

Non-hazardous treated industrial wastewater and the following RCRA-regulated wastes are generated at the Lenox facility: glaze waste, slip waste, and TCE sludge waste. Each waste stream has been stored at the following locations:

- TCE Sludge Waste (USEPA Hazardous Waste Code F001)
  - SWMU No. 1 Degreaser Sludge Pit
  - SWMU No. 12 Drum Storage Area

- Non-hazardous Treated Industrial Wastewater (No USEPA Hazardous Waste Code; NJ Waste Code ID13)
  - SWMU No. 4 Polishing Basin
  - SWMU No. 5 Tilton Road Pond
  - SWMU No. 14 Neutralization Tanks

- Glaze Waste (USEPA Hazardous Waste Code D008)
  - SWMU No. 3 Waste Pile
  - SWMU No. 6 Transfer Pipe
  - SWMU No. 10 Glaze Basin
  - SWMU No. 15 Filter Press

- Slip Waste/Untreated Industrial Wastewater (No USEPA Hazardous Waste Code)
  - SWMU No. 2 Sludge Disposal Area
  - SWMU No. 7 Equalization Sump
  - SWMU No. 8 Wastewater Piping
  - SWMU No. 11 Slip Basin
  - SWMU No. 13 Area Between Monitoring Well #10 and Aloe Street (Area of Concern)

SWMU No. 9, underground tanks, which have been removed, were used to store No. 2 and No. 4 heating oil and gasoline.

Laboratory analyses were performed to characterize the waste material and the analytical results are included in Appendix E. To supplement the waste characterization data, samples of the slip and glaze waste and the treated industrial wastewater will be collected and analyzed for TAL metals to verify that lead and zinc are the only parameters of concern in these wastes. Based on the manufacturing process performed at the Lenox facility, organic compounds are not constituents in the glaze, slip and treated industrial wastewater waste streams and these parameters will not be analyzed as part of the waste characterization program described above.

The contaminants of concern at the site are lead, zinc, and TCE. Table 1 provides a summary of each contaminant's physical and chemical characteristics. Appendix F provides additional information on the migration, transformation, and dispersion characteristics of these contaminants.

2.2.5 Potential Receptors

Potential off-site receptors to site-related contaminants (TCE, lead and zinc) include residences downgradient of the site that obtain potable water from private wells and persons trespassing on Lenox property.

Groundwater downgradient of the Lenox facility is currently a potable water source, and it is also used by residences and commercial properties for non-potable purposes, such as residential garden and lawn watering and farm irrigation. The location of domestic/commercial water supply wells within a one-half mile radius of the site is shown on Figure 1. Surface water flowing from the Lenox property (Tilton Road Pond) discharges to Babcock Swamp, and it is not used for any domestic, industrial, recreational, agricultural or environmental purposes.

Adjacent land use includes a golf course and residential developments southwest of the site across Tilton Road. The remainder of the adjacent properties surrounding the site are undeveloped. A New Jersey Transit rail line runs along Atlantic Avenue and residential and commercial developments are located northeast of Atlantic Avenue. The privately owned, undeveloped properties surrounding the Lenox facility have been used for hunting. However, the Lenox property is posted and any unauthorized persons on its property would be considered a trespasser.

All personnel who are employed by Lenox and are involved with handling hazardous material or waste are aware of the on-site areas that handle or store these materials. Access to hazardous material/waste areas is limited to persons that have been trained in the proper use and handling of these materials. These personnel are covered by the company's health and safety plan and medical surveillance program.

TCE has been detected in several downgradient residential wells, and these wells have been subsequently fitted with point-of-entry treatment units (POETS) to reduce the TCE concentrations to below the 1 ppb NJDEPE MCL. Galloway Township is arranging to provide a municipal potable water supply to all residences and commercial developments downgradient of the Lenox

facility by the end of 1993. If new downgradient developments are proposed before Galloway Township provides a municipal water supply, risk to these receptors would be eliminated through administrative controls implemented by the County Health Department or NJDEPE (permitting restrictions, required installation of POETS) or deed restrictions to limit site development.

Subject to other actions concerning this area, Lenox will construct a fence around SWMU 13 to limit access and direct contact with waste materials in this area. The location of the fence will be based on the boundary of the SWMU, as determined by the sampling program outlined in Section 3.1.13.

2.2.6 Groundwater Corrective Action System

In December 1991, a groundwater corrective action system (GWCAS) was installed at the Pomona facility to remediate TCE-contaminated groundwater. The GWCAS was designed as a closed-loop system and consists of a recovery well network, a granular activated carbon (GAC) treatment unit (2 vessels in series), and two shallow reinjection well fields upgradient of the recovery wells to return the treated groundwater to the aquifer. As required by Part VIII, Section VII of the DGW permit, a semi-annual evaluation of the remediation system is performed and the results are summarized in an semi-annual report issued to NJDEPE. Copies of the first two semi-annual reports are included in Appendix C. The evaluation reports show that the GWCAS is effectively controlling the migration of the TCE plumes.

As part of the GWCAS evaluation, samples of the GAC unit are collected and analyzed for TCE. Samples are collected from the GAC unit influent and effluent sample ports, and from the sample port between the two carbon vessels. Since the system began operating in December 1991, only one GAC unit effluent sample contained detectable concentrations of TCE. The presence of TCE in this sample was determined to be anomalous because the sample collected between the GAC vessels during the same sampling round did not contain TCE.

NJDEPE approved Lenox's Supplementary Groundwater Sampling and Analysis Plan (April 1993) and this plan has been implemented to evaluate the effectiveness of the GWCAS.

3.0 SCOPE OF WORK

Extensive monitoring has already been performed at the Lenox site to determine if SWMUs have released contaminants to soil or groundwater. Investigations which will be conducted under this RFI Work Plan are summarized in Table 2 and described below. The proposed RFI soil boring and monitoring well locations are shown on Figure 2. Sampling procedures are outlined in Appendix G. The RFI Data Collection Quality Assurance Plan that will be implemented is presented in Appendix H.

3.1 Parameters of Concern

The list of parameters to be analyzed during the proposed soil and groundwater sampling program at each SWMU was based on a Chemical Constituent Inventory (CCI) of all raw materials previously and currently used at the Lenox facility. The results of the inventory were presented in a August 25, 1993 letter from Stephen F. Lichtenstein of Lenox to NJDEPE and a copy of this letter, and a certification of accuracy is included in Appendix L. The results of the CCI and a review of Lenox's waste generating process show that lead and zinc are the metals of concern and TCE is the most prominently used organic solvent.

To further refine and confirm the list of parameters to be analyzed during the RFI work, the results of a 1986 groundwater monitoring program performed by Geraghty & Miller were reviewed. Groundwater samples collected from four monitoring wells (MW-1, MW-3, MW-4 and MW-10) during this sampling program were analyzed for Appendix IX constituents and the results, including the raw laboratory data, are included in Appendix B. The sampling results show that the only volatile organic compound detected during this monitoring round was TCE in MW-10 at 370 ug/l; semivolatile organic compounds, pesticides and PCBs were not detected at the method detection limits shown on the data summary table in the G&M report.

In addition to the above, samples of the glaze waste, slip waste and treated industrial waste water will be collected and analyzed for TAL metals to verify that lead and zinc are the only metals of concern.

3.1.1 SWMU No. 1 - Degreaser Sludge Pit

The degreaser sludge pit is located outside the east wall of the manufacturing building. TCE sludge from a degreaser located inside of the building flows through a pipe and is collected in 30 gallon drums at the pit. This area is near the site of a previous degreaser sludge pit and the previous degreaser sludge pit is a suspected source of one of the TCE plumes.

Downgradient Monitoring Well No. 3 has been sampled for TCE since April 1, 1984. The last sampling round was performed in May 1993. Only five of the 24 analytical results for TCE (April 1, 1984, April 4, 1985, May 13, 1992, August 19, 1992 and February 8, 1993) (Appendix B) exceeded the current 1 ppb NJDEPE drinking water standard. All 24 analytical results for TCE were less than the Federal 5.0 ppb drinking water standard (maximum contaminant level). A new downgradient monitoring well (shown on Figure 2) will be installed as part of this RFI Work Plan and sampled for TCE on a quarterly basis to monitor the effectiveness of the groundwater remediation system installed in 1991.

Eight soil borings were drilled near SWMU No. 1 both inside and outside the manufacturing plant on July 12, 1990 (Appendix D). Soil samples taken at each boring were analyzed for TCE. All results were less than the NJDEPE proposed soil cleanup standards of 54 mg/kg (non-residential) and 23 mg/kg (residential), and all but one sample (1.3 mg/kg inside warehouse) were less than the 1.0 mg/kg proposed soil cleanup standard based on groundwater impacts. Therefore, additional soil investigation is not necessary.

3.1.2 SWMU No. 2 - Sludge Disposal Area

Waste sludge containing lead was dredged from the slip basin and placed in an area northeast of the basin. In 1979, this area was paved with asphalt and is now used as a parking area. The depth of sludge has not been determined, although Lenox believes the average depth is less than six inches because only small amounts of sludge were released during construction of the slip basin dike. The volume of sludge in SWMU No. 2 is approximately 350 cubic yards. Downgradient Monitoring Well No. 10 has been sampled for dissolved lead since July 17, 1986. All 27 analytical results for lead (Appendix B) are less than the previous 50 ppb standard. In 1983 11 soil samples were collected in and around the immediate area of SWMU 2 and analyzed for leachable lead (Appendix D). Leachable lead concentrations in these samples ranged from 0.2 to 33 mg/l.

Not withstanding the agreement of the Department and USEPA that there is sufficient vertical and horizontal soil sampling data, since total lead concentrations were not evaluated at the time the soil samples were collected, soil borings will be drilled at the locations shown on Figure 2. Soil samples will be collected at 0 to 6 inches, 6 to 24 inches, then at two-foot intervals to groundwater. The samples will be analyzed for total lead and zinc. In addition, samples of slip waste will be collected and analyzed for total TAL metals. This analysis will be performed to confirm that lead and zinc are the only metals of concern in the slip waste. To verify that lead and zinc have not been released to the groundwater, two rounds of unfiltered groundwater samples will be collected from Well No. 10 and analyzed for lead and zinc. The detection limit for lead and zinc in groundwater will be 10 and 30 ug/l.

3.1.3 SWMU No. 3 - Waste Pile

During excavation of the glaze basin in 1988, a seam was discovered in the west wall of the basin, containing a white, clayey material. This material had high lead and zinc concentrations and the appearance of glaze waste. Lenox suspects that the material may be the remnants of an antecedent basin used to store glaze waste from 1953 to 1964. The glaze seam could not be

removed at the time of the glaze basin excavation because of its proximity to a large trash compactor, an oil tank and an active loading dock.

Sampling and analysis conducted in May 1991 (Appendix I) determined that this seam is approximately 15 feet by 12 feet with a maximum thickness of between 6 and 12 inches (three to six cubic yards). The May 1991 sampling found no significant impact on soil beneath the seam. Lead and zinc concentrations in the subsoil samples were well below the proposed NJDEPE cleanup standard of 600 mg/kg and 1,500 mg/kg, therefore, no further soil sampling is necessary. Furthermore, the glaze seam is currently under asphalt pavement, which will eliminate the potential for glaze waste constituents to leach into the groundwater.

Downgradient Monitoring Well No. 3 has been sampled for dissolved lead since November 23, 1982. Only two of 36 analytical results for lead (October 13, 1987 and July 2, 1984) (Appendix B) exceed the previous groundwater standard of 50 ppb. Nine samples for zinc analysis were taken between August 1988 and August 1990. Only three of these samples had zinc concentrations above the previous 5.0 ppm standard. February 1993 samples from Monitoring Well No. 3 contained no dissolved lead at the 0.05 ppm detection limit and only 2.4 ppm of zinc.

As discussed in Section 3.1, lead, zinc and TCE are the only parameters of concern; however, samples of glaze waste will be collected and analyzed for TAL metals to verify that lead and zinc are the only metals of concern. TCE is not a constituent of the glaze waste and it will not be analyzed as part of the proposed sampling program. To verify that lead and zinc have not been released to the groundwater, two rounds of unfiltered groundwater samples will be collected from monitoring well MW-3 and analyzed for lead and zinc. The detection limit for lead and zinc in groundwater will be 10 and 30 ug/l.

3.1.4 SWMU No. 4 - Polishing Basin

The Polishing Basin received treated industrial wastewater from the treatment plant clarifier. The basin was 90 feet by 60 feet with an average depth of 6 feet. The estimated capacity of the basin

was 110,000 gallons. The Polishing Basin is no longer in operation and is currently undergoing closure.

Downgradient Monitoring Well No. 7 has been sampled for dissolved lead since December 29, 1983. All 35 analytical results for lead (Appendix B) are less than the previous standard of 50 ppb.

As discussed in Section 3.1, lead, zinc and TCE are the only parameters of concern; however, samples of the treated industrial wastewater will be collected and analyzed for TAL metals and TCE to verify that these are the only parameters of concern. To confirm that lead and zinc have not been released to the groundwater, two rounds of unfiltered groundwater samples will be collected from monitoring well MW-7 and analyzed for lead and zinc. The detection limit for lead and zinc in groundwater will be 10 and 30 ug/l. TCE was not detected in MW-7 during the February 1993 sampling round, nor was it detected in sludge samples collected in November 1992 (Appendix E) at the initiation of closure activities.

Eleven soil borings will be drilled along the perimeter and in the interior of the polishing basin under the Polishing Basin Closure/Post Closure Plan revised July 1992 by Eder (Appendix J). Soil samples will be analyzed for total lead and zinc.

3.1.5 SWMU No. 5 - Tilton Road Pond

This lagoon for stormwater and non-contact cooling water has an estimated capacity of 125,000 gallons. It had also previously received treated wastewater from the polishing basin. Tilton Road Pond is monitored for chemical quality. The Tilton Road Pond discharges to culverts which run under Tilton Road and into a stormwater ditch. The ditch discharges into the Jack Pudding Branch of Babcock Swamp.

Downgradient Monitoring Well No. 8 has been sampled for dissolved lead since December 29, 1983. All 35 analytical results for lead (Appendix B) are less than the previous standard of 50 ppb.

To characterize the sediment in Tilton Road Pond, a one-time round of sampling will be performed. Four sediment samples will be collected, one from the inlet, one from the outlet, and two in the center of the pond, as shown on Figure 2. The samples will be analyzed for TCE, pH, NH3, PO4-3, total organic carbon (TOC), total arsenic, total lead and total zinc. In addition, a description of the physical nature of the sediments (depositional area, thickness profile) will be made.

Soil samples will be collected to verify that materials discharged to the pond have not impacted adjacent soil quality. As discussed in Section 3.1, lead, zinc and TCE are the only parameters of concern; however, samples of the treated industrial wastewater will be collected and analyzed for TAL metals and TCE to verify that these are the only parameters of concern. Three soil borings will be drilled at the locations shown on Figure 2 and soil samples will be collected and analyzed for total lead, zinc and TCE.

To supplement the downgradient groundwater quality data base, two rounds of unfiltered groundwater samples will be collected from monitoring well MW-8 and analyzed for lead and zinc. The detection limit for lead and zinc in groundwater will be 10 and 30 ug/l.

One surface water sample will be collected and analyzed for BOD on a one-time basis for characterization purposes.

3.1.6 SWMU No. 6 - Underground Effluent Transfer Pipe

The underground effluent transfer pipe consists of approximately 200 feet of four-inch diameter steel pipe that was used to transfer liquid from the glaze basin to the slip basin. Eighty feet of the pipe closest to the slip basin have been removed.

Downgradient Monitoring Wells Nos. 9 and 15 have been sampled for dissolved lead since July 17, 1986 and November 7, 1990, respectively. All 25 lead results at Monitoring Well No. 9 and

8 lead results at Monitoring Well No. 15 (Appendix B) are less than the previous 50 ppb groundwater standard.

Four soil borings will be drilled at the locations shown on Figure 2 and samples will be collected and analyzed for total lead and zinc. The purpose of the proposed sampling program is to show that materials discharged through the Underground Effluent Transfer Pipe were not released to the surrounding soil and groundwater. As discussed in Section 3.1, lead, zinc and TCE are the only parameters of concern; however, samples of the slip and glaze waste will be collected and analyzed for TAL metals to verify that lead and zinc are the only metals of concern. TCE is not a constituent of the slip and glaze waste and it will not be analyzed as part of the proposed sampling program.

To confirm that lead and zinc have not been released to the groundwater, two rounds of unfiltered groundwater samples will be collected from monitoring wells MW-9 and MW-15 and analyzed for lead and zinc. The detection limit for lead and zinc in groundwater will be 10 and 30 ug/l.

3.1.7 SWMU No. 7 - Equalization Sump

This concrete sump, which measured 8 feet by 12 feet by 6 feet deep, received process wastewater prior to treatment. The sump was taken out of service in 1988, but it was subsequently used to recycle plaster water. The sump was then cleaned, emptied, and removed. The sump area was graded and covered with crushed stones.

Downgradient Monitoring Well No. 4 has been sampled for dissolved lead since November 23, 1982. Only one of 39 analytical results for lead (January 6, 1987) (Appendix B) exceeded the previous groundwater standard of 50 ppb.

Four soil borings will be drilled at the locations shown on Figure 2 and samples will be collected and analyzed for total lead and zinc. The purpose of the proposed sampling program is to show that materials handled by the Equalization Sump were not released to the surrounding soil and

groundwater. As discussed in Section 3.1, lead, zinc and TCE are the only parameters of concern; however, samples of process wastewater will be collected prior to treatment and analyzed for TAL metals and TCE to verify that these are the only parameters of concern.

To confirm that lead and zinc have not been released to the groundwater, two rounds of unfiltered groundwater samples will be collected from MW-4 analyzed for lead and zinc. The detection limit for lead and zinc in groundwater will be 10 and 30 ug/l.

3.1.8 SWMU No. 8 - Wastewater Treatment Piping

This inactive 2-inch piping was previously used to transfer wastewater to the treatment facility from the equalization sump (SWMU No. 7).

Downgradient Monitoring Well No. 6 has been sampled for dissolved lead since December 29, 1983. Only one of 35 analytical results for lead (January 6, 1987) (Appendix B) exceeded the previous groundwater standard of 50 ppb.

Four soil borings will be drilled at the locations shown on Figure 2 and samples will be collected and analyzed for total lead and zinc. The purpose of the proposed sampling program is to show that materials discharged through the Wastewater Treatment Piping were not released to the surrounding soil and groundwater. As discussed in Section 3.1, lead, zinc and TCE are the only parameters of concern; however, samples of process wastewater will be collected prior to treatment and analyzed for TAL metals and TCE to verify that these are the only parameters of concern.

To confirm that lead and zinc have not been released to the groundwater, two rounds of unfiltered groundwater samples will be collected from Well No. 6 and analyzed for lead and zinc. The detection limit for lead and zinc in groundwater will be 10 and 30 ug/l. TCE has never been detected in 28 rounds of sampling at MW-6.

3.1.9 SWMU No. 9 - Underground Storage Tanks

In July 1987, two underground storage tanks, located behind the main manufacturing building, were removed and clean closed in accordance with NJDEPE regulations. They included an 8,200 gallon capacity tank with No. 2 and No. 4 heating oil and a 2,000 gallon tank containing gasoline. The tanks are no longer designated as SWMUs by NJDEPE.

This SWMU has been removed, therefore, soil and groundwater sampling were not required according to NJPDES - DGW Permit Part VI page 5 or USEPA HSWA Permit Module III, Section A3. Further sampling will not be performed at this SWMU under the RFI Work Plan.

3.1.10 SWMU No. 10 - Glaze Basin

This RCRA regulated hazardous waste lagoon was closed in July 1990 in accordance with applicable regulations. Waste glaze material consisting of clay, lead carbonate, and frit were stored in the lagoon. Waste deposited in the lagoon totalled approximately 1,200 cubic yards. Between 1988 and 1990, most of the waste was removed, but a small amount of residual waste remains along the bottom and the north sidewall.

This SWMU has been closed under RCRA. Downgradient Monitoring Well No. 3 has been sampled for dissolved lead since November 23, 1982. Only two of the 36 analytical results for lead (October 13, 1987 and July 2, 1984) (Appendix B) exceeded the previous groundwater standard of 50 ppb. A soil sample taken in May 1991 at this SWMU (Appendix D) contained lead and zinc concentrations less than the NJDEPE proposed soil cleanup standards of 600 and 1,500 mg/kg, respectively.

Further soil or groundwater sampling was not required according to NJPDES - DGW Permit Part VI page 5 or USEPA HSWA Permit Module III, Section A3. Therefore, further sampling will not be performed at this SWMU under this RFI Work Plan.

3.1.11 SWMU No. 11 - Slip Basin

This RCRA regulated hazardous waste lagoon was closed in September 1990. This 7,000 cubic yard lagoon stored clay waste material from 1954 to 1970 and process wastewater containing clay, lead carbonate, frit (low solubility lead compounds in glass form) and silica from 1970 to 1981. From 1981 to 1987, the lagoon received small amounts of process wastewater and was used for wastewater treatment plant surge capacity. The slip basin was closed by raising the waste material above the seasonal high water table, stabilizing the waste material in situ, and capping.

Downgradient Monitoring Well No. 9 has been sampled for dissolved lead since July 17, 1986. All 25 analytical results for lead (Appendix B) are less than the previous standard of 50 ppb. In 1987, nine soil borings were sampled below the clay waste bottom at various depths for lead, and all lead concentrations two feet or deeper are less than the NJDEPE proposed soil cleanup standard of 600 mg/kg (Appendix D).

Further soil or groundwater sampling was not required according to NJPDES - DGW Permit Part VI page 5 or USEPA HSWA Permit Module III, Section A3. Therefore, further sampling will not be performed at this SWMU under this RFI Work Plan.

3.1.12 SWMU No. 12 - Drum Storage Area

This RCRA regulated unit consists of a diked concrete pad designed to store drums of TCE waste sludge. The storage area drains to a sump that is designed to collect spilled material and rain water and pump it into containers. The Drum Storage Area was closed in 1990 pursuant to RCRA closure requirements and now is used to store hazardous waste for less than 90 days. This area is also the site of a previous TCE drum storage area which is a suspected source of one of the TCE plumes.

Downgradient Monitoring Wells Nos. 9 and 15 have been sampled for TCE since October 7, 1986 and July 5, 1988, respectively. Five of the 25 TCE concentrations at Monitoring Well No. 9 (February 22, 1990, August 1, 1990, November 7, 1990, February 5, 1991, and May 7, 1991) were above the current standard of 1 ppb (Appendix B). All 10 TCE concentrations at Monitoring Well No. 15 exceeded this current standard. Sampling will continue to monitor the effectiveness of the groundwater remediation system installed in 1991.

On December 7, 1989, six soil borings were drilled and sampled at three different depths along the pad perimeter. All analytical results for TCE (Appendix D) were less than the NJDEPE proposed soil cleanup standards of 54 mg/kg (non-residential), 23 mg/kg (residential), and 1 mg/kg (groundwater impacts).

As requested by USEPA and NJDEPE, three soil borings will be drilled along the center line of the drum storage pad (Figure 2) and sampled for VOCs. The samples will be collected from the same depths as those collected along the pad perimeter in 1989.

3.1.13 SWMU No. 13 - Area of Concern (AOC)

This area was not identified in the RCRA Facility Assessment. Soil sampling revealed the presence of discolored surficial soils. Subsequent investigations found slip waste in this area.

Downgradient Monitoring Wells Nos. 72, 73 and 74 were sampled for total and dissolved lead on August 13, 1991 (Appendix B). All three analytical results for dissolved lead were less than the previous groundwater standard of 50 ppb.

Eighty-six soil samples were collected and visually inspected to determine the thickness of slip waste (Appendix D). Two soil samples were composited and analyzed for lead using the EP Toxicity Method; one was from all 86 samples and the other was from 10 randomly selected samples. Leachable lead concentrations ranged from 2.8 mg/l in the 10 sample composite to 17 mg/l in the 86 sample composite.

To supplement the soil monitoring data base for SWMU 13, and to confirm the horizontal and vertical extent of slip waste in this area, soil samples will be collected at 0 to 6 inches, 6 to 24 inches, then at two foot intervals to groundwater at the locations shown on Figure 2. The samples will be analyzed for total lead and zinc and, on a one-time basis for characterization purposes, TCE.

As discussed in Section 3.1, lead, zinc and TCE are the only parameters of concern; however, samples of slip and glaze waste will be collected and analyzed for TAL metals to verify that lead and zinc are the only metals of concern.

To determine the concentrations of lead and zinc that may have been released to the groundwater, groundwater samples will be collected from Monitoring Wells MW-72, 73 and 74, and analyzed for lead and zinc. The detection limit for lead and zinc in groundwater will be 10 and 30 ug/l.

The integrity of monitoring wells MW-72, MW-73 and MW-74 has been assessed and the results of this investigation will be presented to NJDEPE and USEPA. As requested by the Department and USEPA, the boring logs and New Jersey Certification Forms A and B for these wells are included in Appendix M.

3.1.14 SWMU No. 14 - Neutralization Tanks

Two 3,750 gallon fiberglass tanks which were installed in April 1991 are located adjacent to the north wall of the plant. These tanks store treated wastewater prior to discharge to the sanitary system. The tanks are regularly inspected for leakage and no leaks have ever occurred.

Downgradient Monitoring Well No. 4 has been sampled for dissolved lead since November 23, 1982. Only one of 39 analytical results (January 6, 1987) (Appendix B) for lead exceeded the previous groundwater standard of 50 ppb.

To confirm that lead and zinc have not been released to the groundwater, two rounds of unfiltered groundwater samples will be collected from monitoring well MW-4 and analyzed for lead and zinc. As discussed in Section 3.1, lead, zinc and TCE are the only parameters of concern; however, samples of treated industrial wastewater will be collected and analyzed for TAL metals and TCE to verify that these are the only parameters of concern. The detection limit for lead and zinc in groundwater will be 10 and 30 ug/l.

Soil sampling is not required for aboveground tanks according to 24 NJR 1711 Site Remediation Program Proposed Rules, if there is no evidence that a contaminant discharge has occurred. Because no such discharge is evident, no investigation at this SWMU is necessary.

3.1.15 SWMU No. 15 - Filter Press

This 5 x 2 foot cast iron press, installed at the north end of the manufacturing plant, has been used to dewater glaze sludge since 1987.

Downgradient Monitoring Well No. 4 has been sampled for dissolved lead since November 23, 1982. Only one of 39 analytical results (January 6, 1987) (Appendix B) exceeded the previous groundwater standard of 50 ppb.

To confirm that lead and zinc have not been released to the groundwater, two rounds of unfiltered groundwater samples will be collected from monitoring wells MW-4 and analyzed for lead and zinc. As discussed in Section 3.1, lead, zinc and TCE are the only parameters of concern; however, samples of glaze waste will be collected and analyzed for TAL metals to verify that lead and zinc are the only metals of concern. TCE is not a constituent of the glaze waste and it will not be analyzed as part of the proposed sampling program.

Because SWMU No. 15 is located on a concrete floor inside a building, soil sampling is not applicable. Lenox personnel routinely inspect the concrete floor to assess its integrity and to determine whether any releases have occurred.

TABLES

LENOX CHINA
POMONA, NEW JERSEY

TABLE 1

PHYSICAL AND CHEMICAL CHARACTERISTICS OF CONTAMINANTS

Property	Lead[a] (Pb)	Zinc[b] (Zn)	Trichloroethylene (TCE)[c]
Physical Form	Solid	Solid	Liquid at room temperature
Molecular Weight	207.20	65.38	131.40
pH	Not Applicable	Not Applicable	Not Applicable
Temperature	Not Applicable	Not Applicable	Not Applicable
Partition Coefficients	No data for K_{ow}, K_{oc}	K_d = 0.1-8000	K_{ow} = 2.42, K_{oc} = No data
Density	11.34 g/cm^3 at 20°C	7.14 g/cm^3 at 25°C	1.465 g/cm^3 at 20°C
Boiling Point	1740°C	908°C	86.7°C
Solubility in Water	Insoluble as element	Insoluble as element	1.07 g/kg at 20°C
Vapor Pressure	Negligible at 25°C	Negligible at 25°C	74 mm Hg at 25°C
Flashpoint	No Data	No data	None

NOTES:

(a) Reference U.S. Department of Health and Human Services Toxicological Profiles for Lead February 18, 1992.
(b) Reference U.S. Department of Health and Human Services Toxicological Profiles for Zinc February 19, 1993.
(c) Reference U.S. Department of Health and Human Services Toxicological Profiles for TCE February 18, 1992.

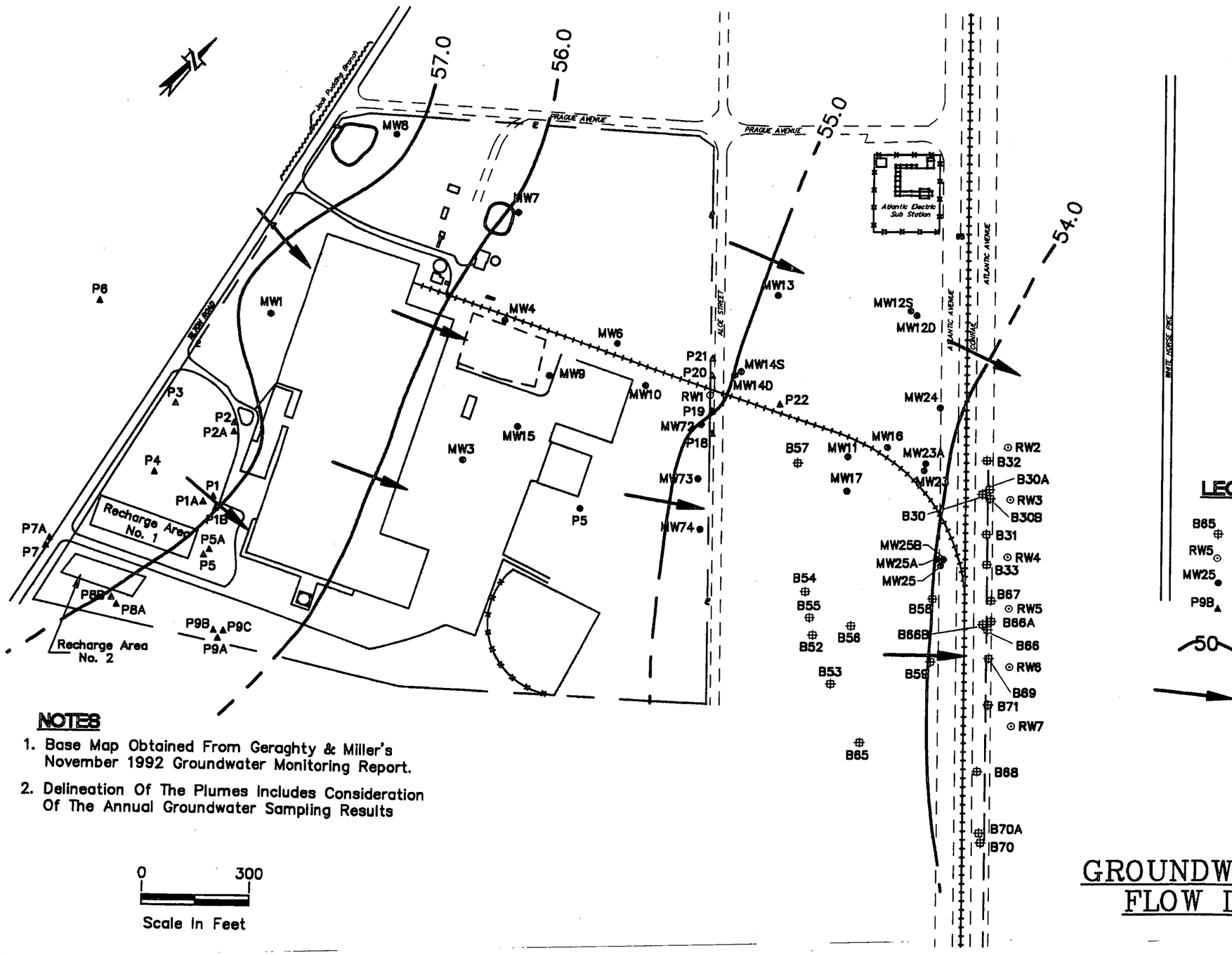
Table 2 Sampling Scope of Work, Lenox China, Pomona, New Jersey

SWMU	Groundwater Sampling	Soil Sampling
1. Degreaser Sludge Pit	Quarterly sampling for TCE at new well	See Appendix D
2. Sludge Disposal Area	Two unfiltered samples for Pb and Zn at Well No. 10	See Appendix D; 14 soil borings sampled at 0-6 inches, 6-24 inches then two foot intervals to groundwater and analyzed for Pb and Zn
3. Waste Pile	Two unfiltered samples for Pb and Zn at Well No. 3	See Appendix I
4. Polishing Basin	Two unfiltered samples for Pb and Zn at Well No. 7	Eleven soil borings pursuant to Closure Program in Appendix J
5. Tilton Road Pond	Two unfiltered samples for Pb and Zn at Well No. 8 One surface water sample for BOD	Four sediment samples from inlet, outlet and middle of pond and analyzed for pH, HN3, PO4-3, TOC, As, Pb and Zn; three soil boring sampled at 0-6 inches, 6-24 inches, then two foot intervals to groundwater and analyzed for Pb, Zn and TCE.
6. Underground Effluent Transfer Pipe	Two unfiltered samples for Pb and Zn at Well No. 9 and Well No. 15	Four soil borings sampled at 6-24 inches below grade and analyzed for Pb and Zn.
7. Equalization Sump	Two unfiltered samples for Pb and Zn at Well No. 4	Four soil borings sampled at 6-8 feet below grade and analyzed for Pb and Zn.
8. Piping	Two unfiltered samples for Pb and Zn at Well No. 6	Four soil borings sampled at 5-7 feet below grade and analyzed for Pb and Zn.
9. USTs	Not required	Not required by permit conditions
10. Glaze Basin	Not required	See Appendix D
11. Slip Basin	Not required	See Appendix D
12. Drum Storage Pad	Quarterly sampling for TCE at Well Nos. 9 and 15	See Appendix D; three soil borings sampled at 0-1.5 feet, 3.5-5 feet and 5-7 feet and analyzed for TCE.
13. Area of Concern	Two unfiltered samples for Pb and Zn at Well Nos. 72, 73, and 74	See Appendix D; 10 soil borings sampled at 0-6 inches, 6-24 inches then two foot intervals to groundwater and analyzed for Pb and Zn
14. Neutralization Tank	See SWMU 7 sampling	Not required by 24 NJR 1711
15. Filter Press	See SWMU 7 sampling	Not required

Notes:

1. Soil results from one SUMU No. 7 boring will also be used for SWMU No. 8
2. In addition to the sampling listed above, slip and glaze waste samples will be collected and analyzed for TAL metals; treated industrial wastewater will be sampled and analyzed for TAL metals and TCE.

FIGURES



NOTES

1. Base Map Obtained From Geraghty & Miller's November 1992 Groundwater Monitoring Report.
2. Delineation Of The Plumes Includes Consideration Of The Annual Groundwater Sampling Results

0 300

Scale In Feet

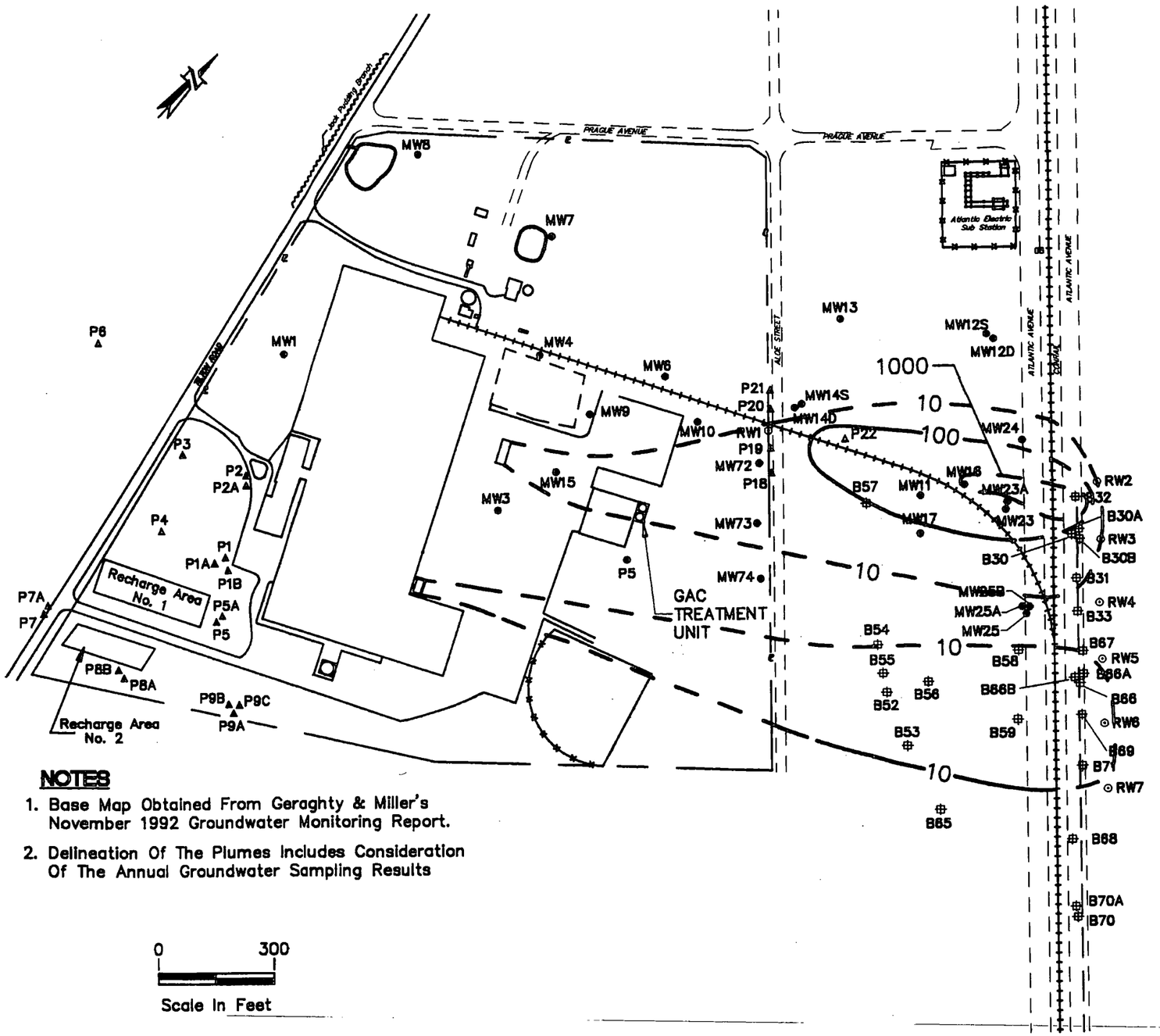
LEGEND-

- B65 — LOCATION OF MONITORING WELL
- RW5 — LOCATION OF RECOVERY WELL
- MW25 — LOCATION OF PIEZOMETER
- P9B — LOCATION OF WELL POINT
- 50 — CONTOUR LINE OF GROUNDWATER SURFACE ELEVATION IN FEET ABOVE MEAN SEA LEVEL
- GENERALIZED DIRECTION OF THE HORIZONTAL COMPONENT OF GROUNDWATER FLOW

GROUNDWATER ELEVATIONS AND FLOW DIRECTION, 11/23/92

LENOX CHINA, INC.
POMONA, NEW JERSEY

SK530-7C
041493



NOTES

1. Base Map Obtained From Geraghty & Miller's November 1992 Groundwater Monitoring Report.
2. Delineation Of The Plumes Includes Consideration Of The Annual Groundwater Sampling Results

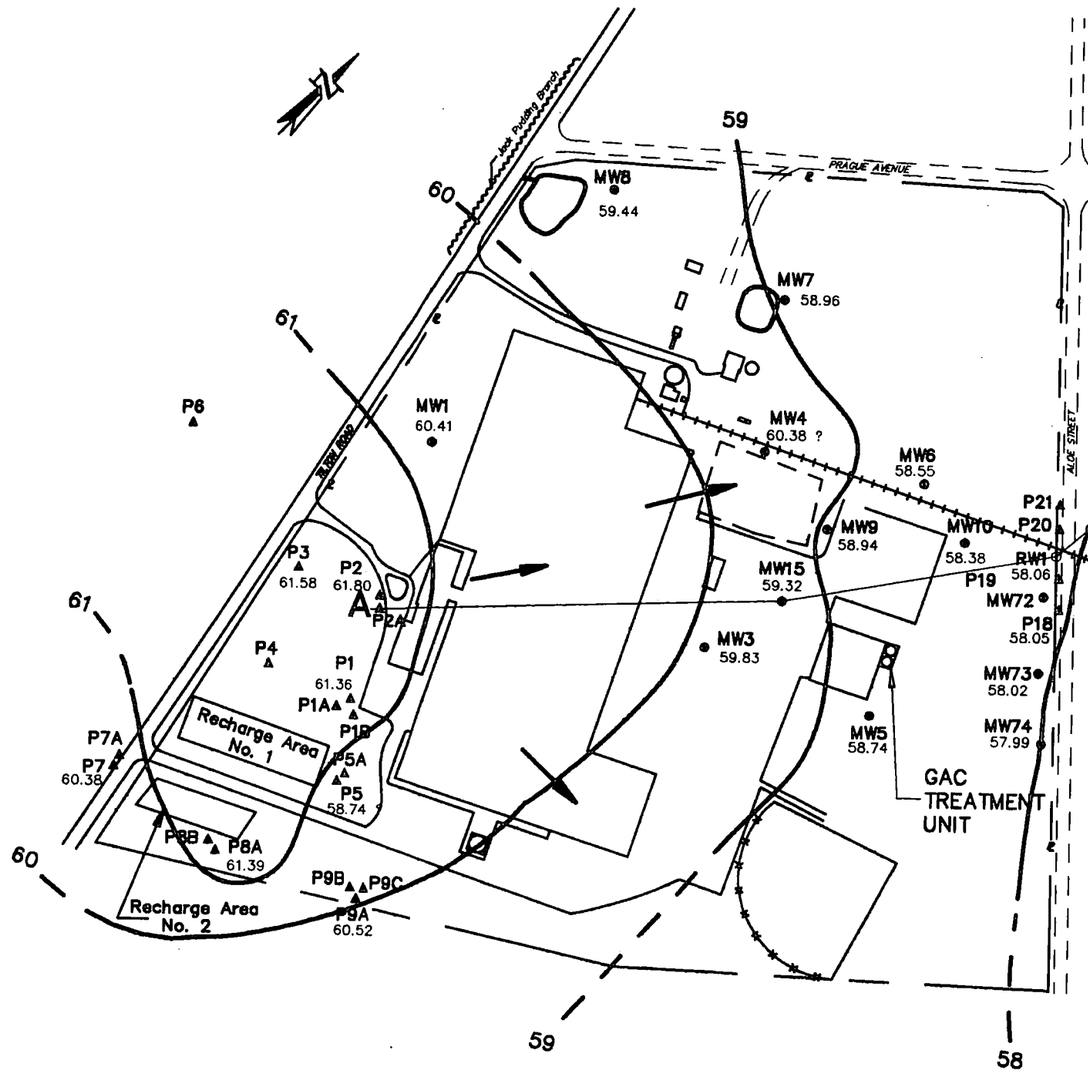
LEGEND

- B65 ⊕ — LOCATION OF MONITORING WELL
- RW5 ⊙ — LOCATION OF RECOVERY WELL
- MW25 ● — LOCATION OF PIEZOMETER
- P9B ▲ — LOCATION OF WELL POINT
- 10 — LINE OF EQUAL TCE CONCENTRATION (ug/l) (DASHED LINES INFERRED)

EXTENT OF TRICHLOROETHENE IN GROUNDWATER NOVEMBER 24, 1992

LENOX CHINA, INC.
POMONA, NEW JERSEY

SK5303AL
042093



Base Map Obtained From Geraghty & Miller's August 1992 Groundwater Monitoring Report.

0 300

Scale In Feet

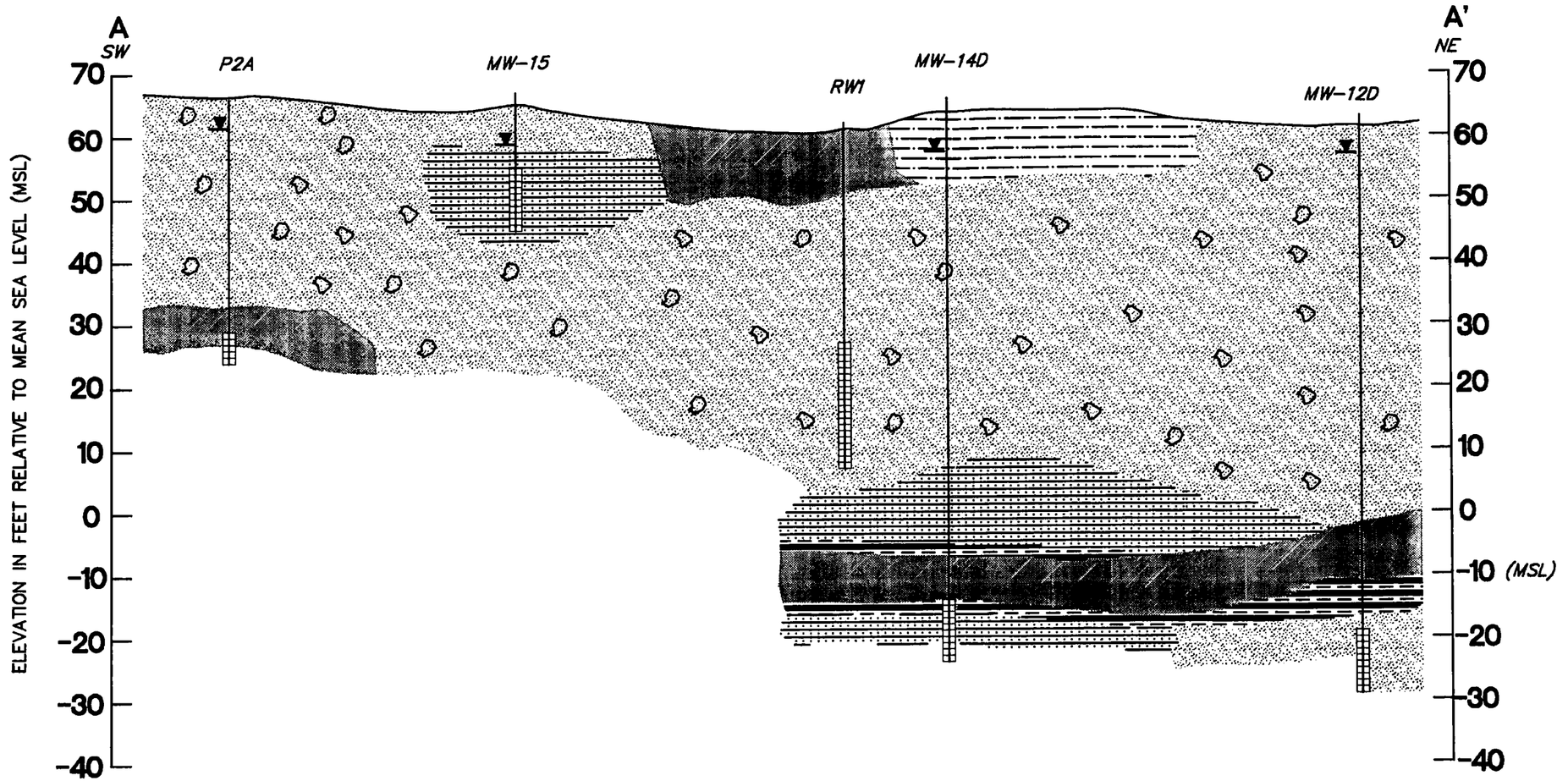
SK5303AO
082693

LEGEND

- B65 — LOCATION OF MONITORING WELL
- RW5 — LOCATION OF RECOVERY WELL
- MW25 — LOCATION OF PIEZOMETER
- P9B — LOCATION OF WELL POINT
- 54.0 — LINE OF EQUAL WATER-LEVEL ELEVATION IN FEET ABOVE MEAN SEA LEVEL (DASHED LINES INFERRED)
- GENERALIZED DIRECTION OF THE HORIZONTAL COMPONENT OF GROUNDWATER FLOW
- A — A' HYDROGEOLOGIC CROSS SECTION LINE

HYDROGEOLOGIC CROSS SECTION LOCATION

LENOX CHINA, INC.
POMONA, NEW JERSEY



LEGEND

- RW-1 — Well Location And Designation
- Screened Interval
- Water Level Elevation May 28, 1993
- Silt
- Sand & Gravel
- Clay
- Sand
- Sand, Silt & Clay
- Sand & Clay

HYDROGEOLOGIC CROSS SECTION A-A'

Vert. Scale 1"=20'
Hor. Scale 1"=200'

HYDROGEOLOGIC CROSS SECTION

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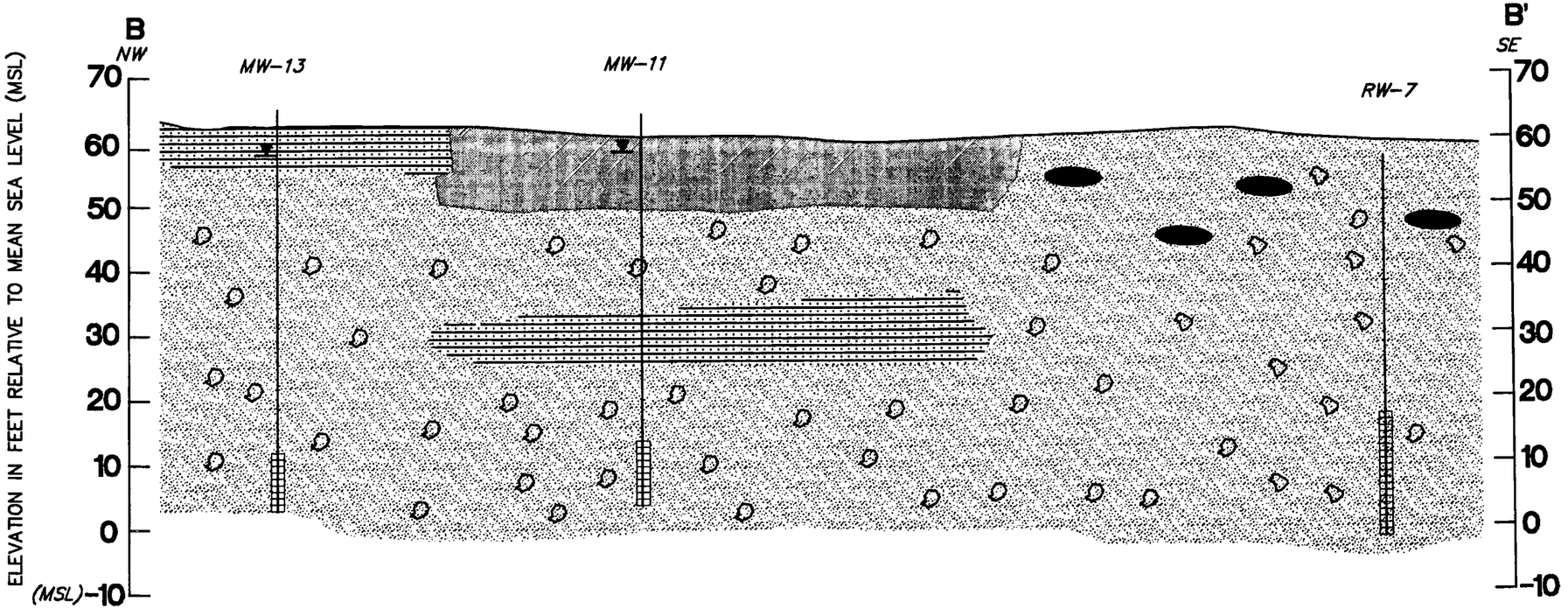

HYDROGEOLOGIC CROSS SECTION B-B'

Vert. Scale 1"=20'
Hor. Scale 1"=200'

LEGEND

- *RW-1* — *Monitoring Well Location And Designation*
- *Screened Interval*
- *Water Level Elevation May 28, 1993*
- *Sand & Gravel*
- *Sand, Silt & Clay*
- *Sand & Clay*
- *Clay Lenses*

HYDROGEOLOGIC CROSS SECTION

LENOX CHINA
POMONA, NEW JERSEY

SK530-7E
082693